

1           1.    A method comprising:  
2                   forming a base contact in a semiconductor  
3 structure;  
4                   covering said semiconductor structure with a  
5 layer;  
6                   forming an electrical connection through said  
7 layer to said contact; and  
8                   forming a phase-change material over said layer,  
9 said material electrically coupled to said contact.

1           2.    The method of claim 1 wherein covering said  
2 semiconductor structure with a layer includes covering said  
3 structure with at least one insulating layer.

1           3.    The method of claim 2 including forming a passage  
2 through said insulating layer.

1           4.    The method of claim 3 including forming the  
2 electrical connection through said passage.

1           5.    The method of claim 4 wherein forming an  
2 electrical connection includes forming a cup-shaped  
3 electrical connection.

1           6.    The method of claim 5 including filling said cup-  
2 shaped electrical connection with an insulator.

1           7.    The method of claim 6 including forming a lower  
2 electrode coupled to said cup-shaped connection.

1           8.    The method of claim 7 including forming a cup-  
2 shaped lower electrode.

1           9.    The method of claim 8 including forming a  
2 sidewall spacer in said cup-shaped lower electrode.

1           10.   The method of claim 9 wherein forming a phase-  
2 change material includes depositing a phase-change material  
3 over said insulating layer and said spacer and electrically  
4 contacting said lower electrode.

1           11.   A memory comprising:  
2                a semiconductor structure;  
3                a base contact formed on said semiconductor  
4 structure;  
5                an insulating layer over said semiconductor  
6 structure;  
7                a passage formed through said insulating layer,  
8 said passage including an electrical connection; and  
9                a phase-change material electrically coupled to  
10 said electrical connection.

1           12. The memory of claim 11 wherein said electrical  
2 connection is cup-shaped.

1           13. The memory of claim 12 including a lower  
2 electrode.

1           14. The memory of claim 13 including a sidewall  
2 spacer on said lower electrode.

1           15. The memory of claim 14 wherein the phase-change  
2 material is formed over said sidewall spacer and in contact  
3 with said lower electrode.

1           16. The memory of claim 15 including an insulating  
2 material within said cup-shaped electrical connection.

1           17. The memory of claim 16 wherein said lower  
2 electrode is cup-shaped.

1           18. The memory of claim 17 wherein said lower  
2 electrode is recessed below the upper surface of said  
3 insulating layer.

1           19. The memory of claim 18 including an upper  
2 electrode over said phase-change material.

1           20. A memory comprising:  
2               a semiconductor structure;  
3               a phase-change material spaced above said  
4 semiconductor structure; and  
5               a tubular connector electrically coupling said  
6 phase-change material to said semiconductor structure.

1           21. The memory of claim 20 including an insulating  
2 layer over said semiconductor structure.

1           22. The memory of claim 21 including a passage formed  
2 through said insulating layer.

1           23. The memory of claim 22 wherein said passage is  
2 lined with said tubular connector.

1           24. The memory of claim 20 including a lower  
2 electrode electrically coupled to said phase-change  
3 material and said connector.

1           25. The memory of claim 24 wherein said lower  
2 electrode is tubular.

1           26. The memory of claim 20 wherein said connector is  
2 cup-shaped.

1           27. The memory of claim 26 wherein said lower  
2 electrode is cup-shaped.

1           28. The memory of claim 27 including a sidewall  
2 spacer over said electrode and between said electrode and  
3 said phase-change material.

1           29. The memory of claim 28 wherein said sidewall  
2 spacer is positioned within said passage and wherein said  
3 sidewall spacer is cylindrical.

1           30. The memory of claim 29 including an upper  
2 electrode over said phase-change material.